



P.B. 5818 - Patentaan 2  
2280 HV Rijswijk (ZH)  
☎ (070) 340 2040  
Tx 31651 epo nl  
FAX (070) 340 3018

Europäisches  
Patentamt  
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European  
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Division de la  
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Jorritsma, Ruurd  
Nederlandsch Octrooibureau  
Postbus 29720  
2502 LS Den Haag  
PAYS-BAS

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Nederlandsch Octrooibureau  
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Zeichen/Ref./Réf. P207520EP	Anmeldung Nr./Application No./Demande n°/Patent Nr./Patent No./Brevet n° 03076422.9-2222/
Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire ASML Netherlands B.V.	

## COMMUNICATION

The European Patent Office herewith transmits the partial European search report under Rule 46(1) EPC relating to the above-mentioned European patent application.

Copies of the documents cited in the search report are enclosed.

The applicant's attention is drawn to the following:

The search Division informs the applicant that if the European search report is also to cover inventions other than the invention first mentioned in the claims, a further search fee must be paid for each of these inventions, within ONE MONTH after notification of this communication.

If the application has been filed up to 30 June 1999, the search fee in force before 01 July 1999 (EUR 869,-) or the equivalent applicable on the date of payment is payable.

This applies also to the search fees requested under Rule 46(1) EPC.  
See also OJ EPO 06/1999, 405.

- ☐ The abstract was modified by the Search Division and the definitive text is attached to the present communication.
- ☒ Additional set(s) of copies of the documents cited in the European search report is (are) enclosed as well. (02)



## Note to users of the automatic debiting procedure:

Unless the EPO receives prior instructions to the contrary, the search fee(s) will be debited on the last day of the period for payment. For further details see the Arrangements for the automatic debiting procedure, Supplement to OJ EPO 02/1999.

REGISTERED LETTER



European Patent  
Office

# PARTIAL EUROPEAN SEARCH REPORT

Application Number

under Rule 46, paragraph 1 of the European Patent Convention EP 03 07 6422

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 6 420 791 B1 (WANG SHIH-CHE ET AL) 16 July 2002 (2002-07-16)	8	G03F9/00
A	* abstract; figure 3B *	1-7	
A	US 2002/158193 A1 (JOHNSON KENNETH C ET AL) 31 October 2002 (2002-10-31) * paragraphs '0063!', '0076!'-'0078!', '0081!'; figures 5-8 *	1-8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			G03F
LACK OF UNITY OF INVENTION			
The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:			
see sheet B			
The present partial European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims.			
Place of search		Date of completion of the search	Examiner
MUNICH		11 March 2004	Angioni, C
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-8

Claim 1 to 8 relate to an alignment mark having a first set of structural elements (a grating) reflecting light on a first level and a second set of structural elements reflecting light on a second lower level. The special technical feature of the invention is an opaque layer having recesses and reflecting light on the 2nd level (claim 1) or a set of parallel metal lines reflecting light on the second level (claim 8). Phase depth can thereby be controlled.

2. Claims: 9-10

Claim 9 to 10 relate to a single level mark having a first periodic structure (narrow lines of a first material alternating with broad lines of a second material) and a second periodic structure (narrow lines of the second material alternating with broad lines of the first material). The first and second periodic structures are adjacent (in the non periodic direction) so that the broad/narrow lines of the first structure face the broad/narrow lines of the second structure. The special technical feature of claim 9 relates to the geometrical arrangement and composition of the two gratings. Misalignment can thereby be distinguished from CMP process effects.

The two inventions solve two completely different problems and have no common novel feature.

A mark consisting of an embedded diffraction grating encompasses all the common features of the two inventions and is already known. Furthermore, the special technical feature of the first invention (recess in opaque layer) relates to the problem of phase depth control whereas the special technical features of the second invention (geometrical arrangement and composition of two gratings) solve the problem of alignment signal shift due to process induced mark asymmetry, i.e. there is no context with the problem of the first invention.

The present European patent application comprised at the time of filing more than ten claims. No claims fees have been paid within the prescribed time limit.

The present communication therefore does not take into account any claims other than those mentioned hereabove.

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

**EP 03 07 6422**

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

**11-03-2004**

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6420791	B1	16-07-2002	NONE	
US 2002158193	A1	31-10-2002	W0 02065545 A2	22-08-2002